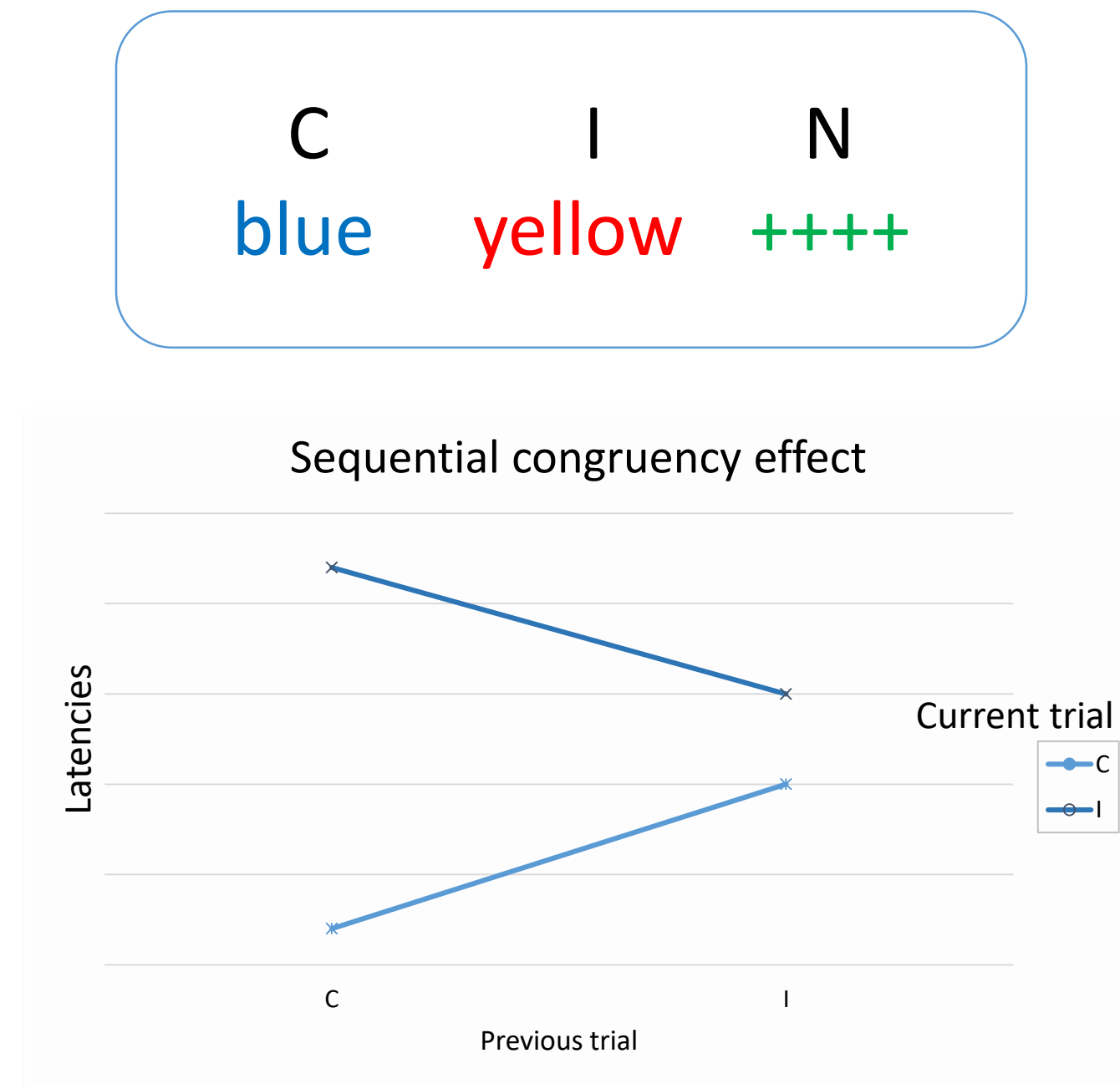
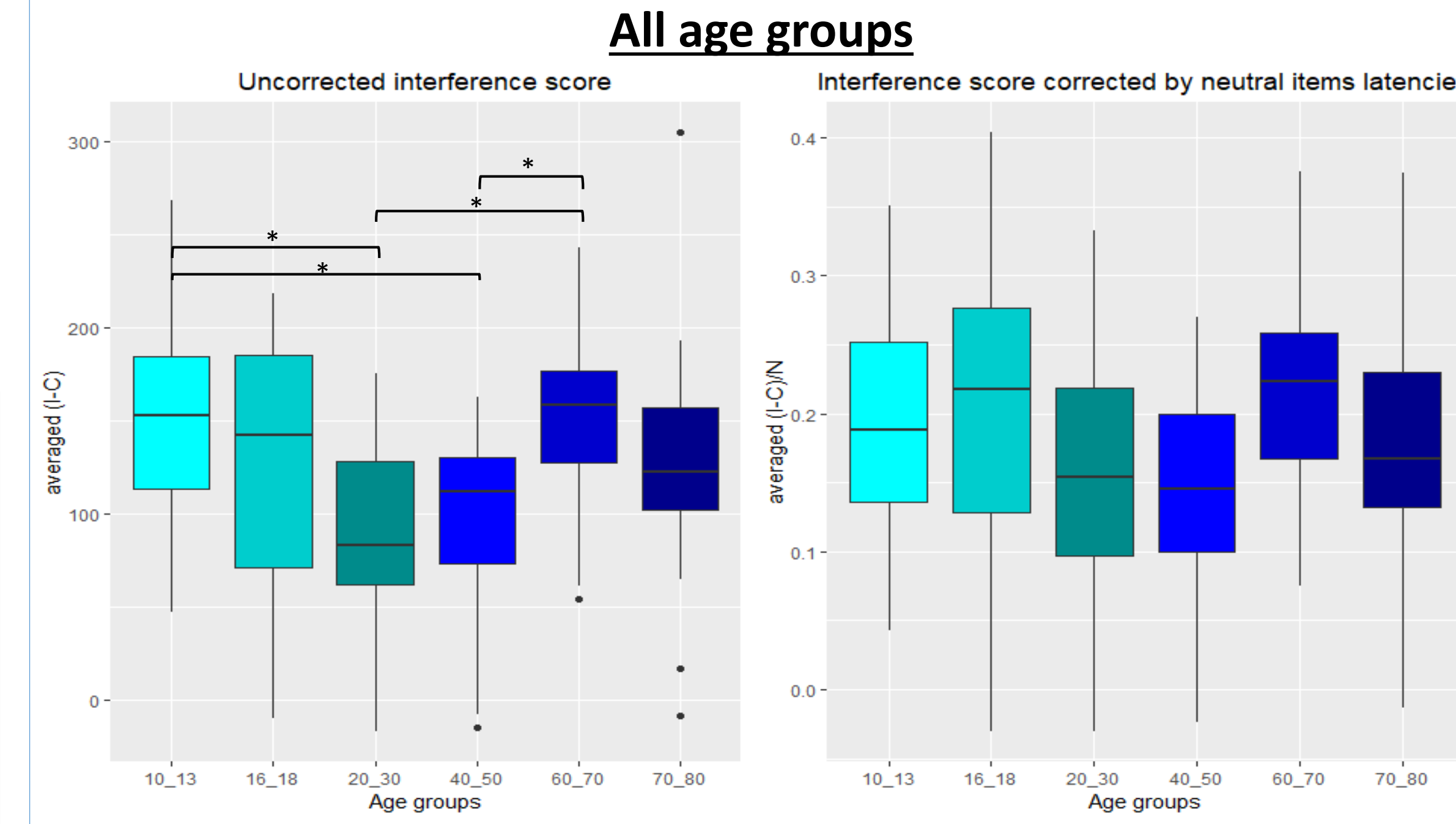


## Introduction

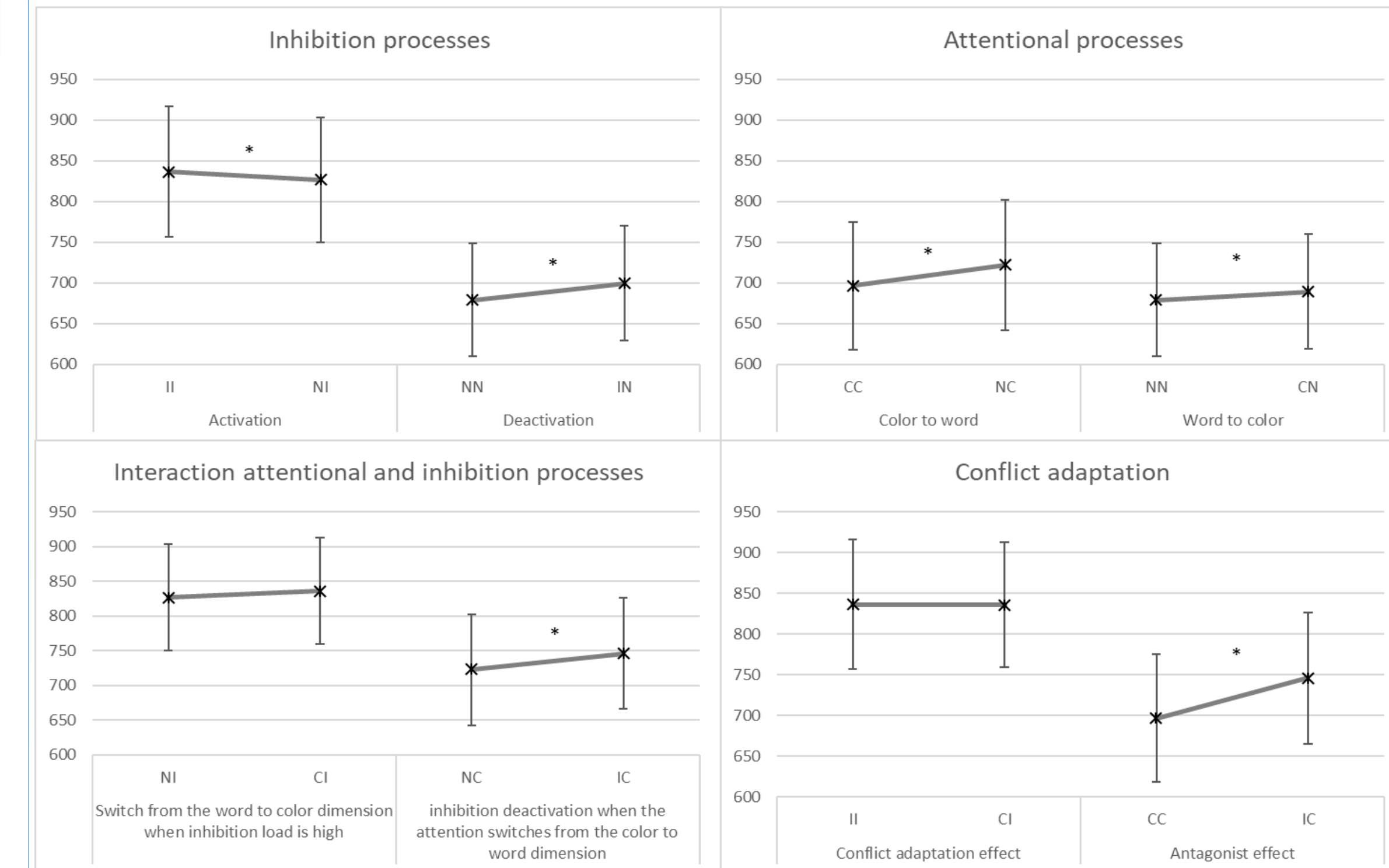
- Stroop task :
  - Color-word interference task (Stroop, 1935; MacLeod, 1991)
  - Used ++ in cognitive psychology as well as in neuropsychology
- Sequential congruency effect**, also called **conflict adaptation (CA)**:
  - Impact of the previous trial on the current one
  - Facilitation of condition repetition → **Gratton effect** (Gratton et al., 1992) → with repetition, no reorientation of the attentional and inhibition processes
  - Such effects usually not exploited for clinical purposes
- Evolution of Stroop performances across the lifespan :
  - Performances follow a **U-shaped curve**
  - If processing speed is taken into account → no effect of age (Rey-Mermet & Gade, 2017)
  - CA**: same effects for children; never tested on the entire lifespan



## Results



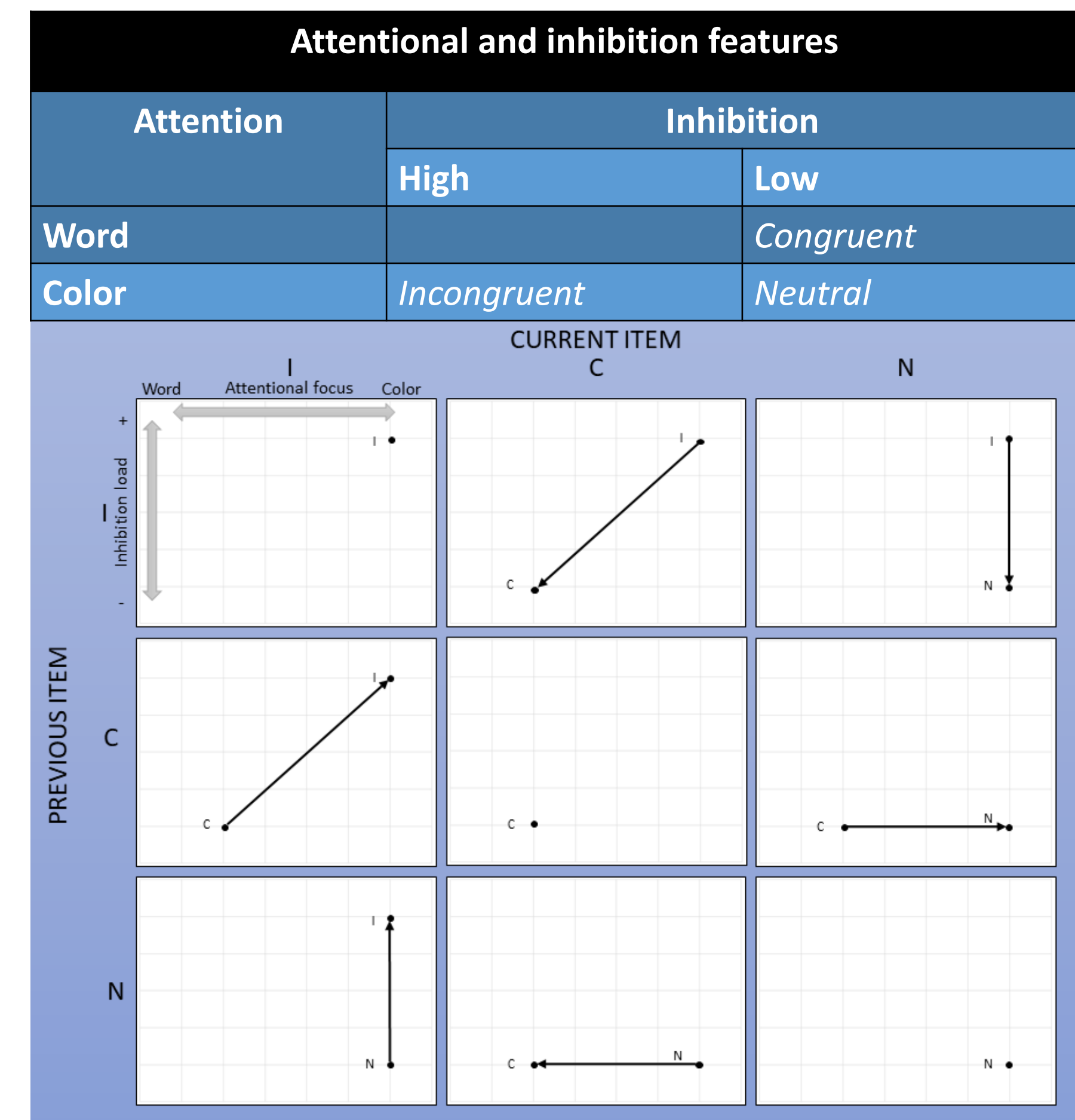
- Replication of the Stroop effect
- Interference on the lifespan:
  - significant differences among age groups with uncorrected scores → U-shaped curve
  - disappear with correction
- Exploration of individual differences → large variability → need of evaluation on a clinical sample



- Main effect of current and previous trial, **no interaction with age groups** → analyses on all age groups together
- Partial replication of the conflict adaptation effect
  - $CC < IC$ , but  $II = CI$
- Isolation of the attentional processes in the Stroop task
- Partial effect regarding inhibition processes:
  - Inversed effect for activation  $II > NI$
- Interaction between attention and inhibition
- Significant differences between age groups for the uncorrected interference score → disappear with correction

## Aims and hypotheses

- Attentional and executive resources → often not dissociated in cognitive psychology but interpreted as 2 separate processes in clinical neuropsychology
- No neutral trials in the CA literature
  - Adding neutral trials → dissociation of the 2 processes in a CA paradigm
- Replication of Rey-Mermet and Gade's (2017) finding : suppression of the evolution when speed processing is controlled ?
  - Interference score: uncorrected and corrected :  $I - C$  vs.  $\frac{I-C}{N}$
- Evolution of the conflict adaptation effect across the entire lifespan
- Explore the possible clinical applications of the CA



## Method

- 119 healthy participants, 6 age groups : 10-13 ; 16-18 ; 20-30 ; 40-50 ; 60-70 ; 70-80
- 4 colors Stroop task (blue, yellow, red, green) requiring oral responses in French
- 3 types of trials : congruent - C - (e.g. "blue" in blue) ; incongruent - I - (e.g. "red" in green) ; neutral - N - (e.g. "^^^" in yellow) ; Hommel et al., 2004)
- 180 trials → pseudorandomized, no repetition of the same color from the previous trial to the next one (feature integration theory ; Hommel et al., 2004)
- 9 conditions defined by the current trial relatively to the previous trial type : CC ; NC ; IC ; NN ; CN ; IN ; II ; NI ; CI
  - Analyzed with mixed linear models, corrected using Bonferroni method for multiple comparisons
- Interference score : differences estimated by a one-way ANOVA among age groups. Post-hoc tests performed by Tukey tests

## Discussion

- Conflict adaptation effect only partially replicated :
  - The response modality (verbal vs manual) and number/type of conditions → addition of neutral trials, may change the balance between facilitation and interference (Abdel Rahman, 2009) → more interference than facilitation is needed to observe the CA effect
- Dissociation of the attentional and inhibition components involved in the Stroop task
  - The 2 processes can be isolated
- Explorations of the inter-individual differences
  - Fragility between interference and facilitation → ++ inter-individual variability
  - Potential clinical application for testing the dissociation with patients presenting attentional or executive impairments
  - Possibility to develop an informatized clinical protocol → automatic calculation of attention and executive functioning scores

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